INDIANA STROKE GUIDELINES

Robert Flint, M.D., Ph.D.

INDIANA EPIDEMIOLOGY

- 7th highest stoke rate in the country
- 18th in mortality from stroke
- 2% of Indiana population living with sequelae of stroke
- Cost of medical for stroke in Indiana is $300 million

NEED FOR STROKE TASK FORCE

- Epidemiologic data
- Lack of public awareness
- Lack of assertiveness with stroke treatment
- Stroke center certification
- Availability of federal funds for improvement of stroke care

LEGISLATION

- Strongly supported by AHA/ASA
- Failed in 2003 session
- Governor O'Bannon died from hemorrhagic stroke
- Legislation passed in 2004
- IC 16-41-41 created Indiana Stroke Prevention Task Force

COMPOSITION

- Neurologist
- Cardiologist
- Neuroradiologist
- ER physician
- Registered nurse
- Rehab therapist
- EMS
- Hospital administrator
- Health commissioner
- Secretary of family services
- Stroke support organization(2)
- Indiana minority health coalition
- Stroke survivor

STROKE TASK FORCE

- Assess the needs for stroke care in Indiana
- Educate the public regarding stroke
- Maintain awareness of the most effective strategies for the medical intervention in stroke
- Advise the DOH of grant opportunities for health care providers related to stroke
- Provide guidelines for the care of stroke patients

MANAGEMENT OF STROKE

- Prevention
- Recognition
- Treatment
  - Acute
  - Long-term
- Hospital Systems

GUIDELINES

- Risk Factors
- Transient ischemic attack
- Stroke

FORMAT

- Introduction
- Background
- Recommendations

BACKGROUND

- Stroke Council of the AHA
- Brain Attack Coalition
- ASA Task Force on the Development of Stroke Systems

RECOMMENDATIONS

- Derived from standard evidence-based medicine assessment criteria
- Provide a basis for the management of stroke
- Minimum standard for such management
- Benchmark for initiating stroke management
- Suggest that level of care may vary with level of expertise and available technology

UNMODIFIABLE RISK FACTORS

- Age
- Gender (male)
- Ethnicity (African American)
- Heredity

MODIFIABLE RISK FACTORS

- Asymptomatic carotid stenosis
- Hypertension
- Coronary artery disease
- Atrial fibrillation
- Tobacco use
- Sickle cell disease
- TIA/CVA
- Diabetes mellitus
- Hyperhomocysteinemia
- Hyperlipidemia
- Other cardiac disease
- Obesity
- Physical inactivity
- Hormone replacement
- alcohol/drugs
- Hypercoagulability/inflammation
- Sleep apnea

GUIDELINES

- Background
  - Risk relationship
  - Available intervention
- Recommendations
  - Diagnostic techniques
  - Preferred treatment

TIA: CHARACTERISTICS

- Neurologic deficit
- Duration of less than an hour
- No permanent sequelae
- No imaging abnormality
- Is a risk factor for stroke (10% in month)

TIA: DIFFERENTIAL DIAGNOSIS

- Seizure
- Migraine
- Metabolic disturbance
- Vestibulopathy
- Cerebral vessel aneurysm
- Ocular disorder
- Hyperventilation
- Conversion

TIA: DIAGNOSIS

- History
  - Time course
    - Onset
    - Duration
  - Symptoms
- Physical examination
  - Neurologic
  - Cardiac
  - Neck
  - Vital signs
- Testing
  - Laboratory
  - Imaging
  - ECG

CINCINNATI PRE-HOSPITAL STROKE SCALE

- Easy to interpret
- Quick to perform
- Components
  - Facial droop
  - Arm drift
  - Speech problem

TIA: TREATMENT

- Medical
  - Antiplatelets
  - Anticoagulants
  - Metabolics
- Surgical
  - Endarterectomy
  - Stenting

ANTIPLATELET MEDICATION

- Types
  - Aspirin
  - Clopidrogel
  - Ticlopidine
  - Dipyridamole/aspirin
- Aspirin and clopidrogel
  - Equivalent efficacy against stroke
  - Used together, may cause more problem than benefit as the combination is no better than indivdiually

TIA: RECOMMENDATIONS

- Education
  - Patients
  - EMS personnel
  - Hospital personnel (including M.D.'s)
- Evaluation
  - Verify diagnosis
  - Determine cause

TIA: RECOMMENDATIONS

- Management
  - More patient education
  - Identify risk factors
  - Treat risk factors
  - Treat cause

CVA: CHARACTERISTICS

- Neurologic deficit
- Lasting longer than 24 hours
- Abnormality on imaging
- Permanent deficit

CVA: ETIOLOGY

- Cardiac: embolus
- Large vessel: embolus or thrombus
- Small vessel: thrombus
- Blood: coagulopathy
- Cryptogenic: undetermined

CVA: DIFFERENTIAL DIAGNOSIS

- Seizure
- Migraine
- Metabolic disturbance
- Subdural hemotoma
- Brain tumor
- Trauma
- Intoxication
- Brain infection

CVA: DIAGNOSIS

- History
  - Time course
  - Symptoms
  - Associated factors
    - Provocation
    - Other symptoms
- Physical examination
  - Same as for TIA
- Testing
  - Same as for TIA

CVA: TREATMENT

- Immediate
  - tPA
    - Intravenous
    - Intraarterial
  - Experimental procedures
    - Hypothermia
    - Desmoteplase
- Prophylactic
  - Antiplatelet medication
  - Anticoagulation
  - Metabolic
  - Surgical

CVA: TREATMENT

- Subacute
  - After tPA
    - Close monitoring in ICU
  - Supportive care
    - Stabilize vital signs
    - Monitor cardiac rhythm
    - Monitor blood sugar
  - Avoid complications
  - Identify and treat risk factors

CVA: REHABILITATION

- Training for maximal recovery
- Prevent and treat comorbid conditions
- Enhance psychosocial coping
- Promote reintegration into the community
- Prevent recurrent events
- Improve quality of life

CVA: RECOMMENDATIONS

- Education
  - Patients
  - EMS personnel
  - Hospital personnel (including M.D.'s)
- Evaluation
  - Verify diagnosis
  - Identify cause
  - Determine severity

CVA: RECOMMENDATIONS

- Management
  - Acute
    - Stabilize in field and transport quickly
    - tPA if appropriate
  - In hospital
    - ICU if tPa
    - Supportive care
      - Ventilaton
      - Fever
      - Cardiac rhythm

CVA: RECOMMENDATIONS

- Blood sugar
- Blood pressure

- Minimize complications
  - Aspiration
  - Deep venous thrombosis
  - Pressure sores
  - Infection
  - Depression
  - Falls
  - Cerebral edema and increased ICP
  - Seizures
  - Hemorrhagic transformation

CVA: RECOMMENDATIONS

- Treat etiology
  - Atrial fibrillation
  - Carotid stenosis
  - Intracranial vascular disease
  - Coagulopathy
- Identify and treat risk factors
- Rehabilitation
  - Initiate therapies ASAP in acute care
  - Determine more long term needs
  - Determine ability to participate
  - Maximize rehab efforts in appropriate facility

HOSPITAL ORGANIZATION

- Stroke protocols
- Stroke teams
- Stroke centers
- Hospital systems

STROKE PROTOCOLS

- Stroke pathways
  - Patient evaluation
  - Stroke treatment
  - Secondary prevention
  - Nursing management
- Standing orders
  - tPA administration
  - Patient management after tPA
  - Subacute management
- Advantages
  - Increases use of select medications and treatments
  - Improves patient assessment
  - Reduces unnecessary testing
  - Shortens length of stay

STROKE TEAMS

- Specialization in diagnosis and treatment of stroke
- Includes all individuals and departments necessary for stroke intervention
- Rapid response via pager 24/7 for event anywhere in the hospital

STROKE CENTERS

Purpose: to provide a cohesive infrastructure in a health care facility for the optimal management of patients with stroke

STROKE CENTERS

- Primary
  - Assess and diagnose patients with stroke
  - Stabilize patient
  - Provide emergency care including tPA
- Comprehensive
  - Complete inpatient care
  - Specialized testing
  - Specialized procedures
  - Rehabilitation
  - Research

HOSPITAL SYSTEMS

- Between hospitals
  - Without and with certain technologies
  - Acute care and specialty (i.e. rehab)
- Between hospitals and EMS's
- Between hospitals and special interest groups (e.g. ASA, NSA)

HOSPITAL SYSTEMS

- Enhances public awareness
- Facilitates provider education
- Improves treatment times
- Enables better availability of services
- Provides coverage for those neurologically underserved areas
- Promotes greater cost effectiveness
- Does not imply exclusivity

PRIMARY CARE: RISK FACTORS

- Know the risks
- Look for them in each of your patients
- Treat those identified risks
  - Yourself
  - Specialty consult
- Educate your patients
  - About the risks for stroke
  - About the risk factors themselves
  - About how to avoid or minimize their risks

PRIMARY CARE: TIA

- Event occurred more than 2 weeks ago
  - Start aspirin if not already using and if not contraindicated
  - Obtain routine neurology consult
  - May initiate evaluation
    - Head MRI
    - Carotid doppler
    - Laboratory

PRIMARY CARE: TIA

- Single event within the last 2 weeks
  - Start aspirin if not already using and if not contraindicated
  - Head CT within 24 hours
  - ECG within 24 hours
  - Carotid doppler
  - Echocardiogram
  - Neurology consult within 1 week

PRIMARY CARE: TIA

- Multiple recurrent events up to presentation
  - Immediate aspirin, if not already using and not contraindicated
  - Immediate ECG
  - Immediate neurology consultation
    - In office
    - In ER

PRIMARY CARE: CVA

- Assess condition
- Stabilize as possible
- Nothing by mouth
- Call neurologist about admission
- Call EMS for transport to hospital

PRIMARY CARE: FOLLOW UP

- Reinforce risk that led to stroke
- Manage risk factors
  - Medical treatment
  - Monitoring
- Encourage life style changes
- Specific monitoring
  - Carotid doppler yearly if >50%
  - Homocysteine level 3 monthes after treatment
  - Blood sugar
  - Lipid profile yearly
  - Coagulation parameters

WHAT ISPTF WILL DO

- Continue to spread the word
- Attempt to equilibrate stroke care across the entire state
- Monitor latest trends in stroke care
- Continually update the Guidelines
- Provide support and guidance to all health care providers regarding management of stroke

PUBLICATION

- Indiana state department of health
  - www.in.gov/isdh/publications/pdfs/IndianaStroke/guidelines.pdf
- Other web-sites
  - EMS
  - Nursing
  - ISMA
  - Specialty organizations
  - Stroke support groups
  - American Heart Association
  - Great Lakes Stroke Coalition